## Computer Science

**Himachal Pradesh University**

**Scheme & Syllabus**

**In the Subject of Computer Science for B. Sc. with Major in Computer Science and Minor Elective in Computer Science (2013-2014 onwards)**

(A) Structure of Major in Computer Science (Minimum Credits to be Earned=56)

<table>
<thead>
<tr>
<th>Semester</th>
<th>Course Code</th>
<th>Course Type</th>
<th>Course Name</th>
<th>Credit(s)/week</th>
<th>Cumulated Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>I (Odd)</td>
<td>BSCCSC0101</td>
<td>Major Core Course I</td>
<td>Computer Fundamentals</td>
<td>3</td>
<td>Compulsory 6 Core – 8 Minor 8 GI &amp; H 2 Total 24</td>
</tr>
<tr>
<td>I (Odd)</td>
<td>BSCCSC0102</td>
<td>Major Core Course II</td>
<td>P C Software</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>I (Odd)</td>
<td>BSCCSC0102(P)</td>
<td>Major Core Lab Course II</td>
<td>PC Software Lab 1</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>I (Odd)</td>
<td>BSCCSC0103</td>
<td>Major Core Course III</td>
<td>Computer Organization &amp; Architecture</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>I (Odd)</td>
<td>BSCCSC0104</td>
<td>Major Core Course IV</td>
<td>Programming in C</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>II (Even)</td>
<td>BSCCSC0106</td>
<td>Minor Elective Course I (a)</td>
<td>To be Selected from the list of Minor Elective Courses other than Computer Science</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>II (Even)</td>
<td>BSCCSC0107</td>
<td>Minor Elective Course I (b)</td>
<td>To be Selected from the list of Minor Elective Courses other than Computer Science</td>
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</tr>
<tr>
<td>II (Even)</td>
<td>BSCCSC0108</td>
<td>Minor Elective Course II (a)</td>
<td>To be Selected from the list of Minor Elective Courses other than Computer Science</td>
<td>4</td>
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<tr>
<td>II (Even)</td>
<td>BSCCSC0109</td>
<td>Minor Elective Course II (b)</td>
<td>To be Selected from the list of Minor Elective Courses other than Computer Science</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Semester</td>
<td>Course Code</td>
<td>Course Type</td>
<td>Course Name</td>
<td>Credit(s)/ week</td>
<td>Cumulated Credits Category-wise</td>
</tr>
<tr>
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<td>---------------------------------</td>
</tr>
<tr>
<td></td>
<td>BSCCSC0204(P)</td>
<td>Major Core Lab</td>
<td>C Programming Lab II</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Course IV</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>GI and H Course II</td>
<td>To be Selected from the list GI and Hobby Courses</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Compulsory Course V</td>
<td>To be Selected from the list of Compulsory Courses</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>III</td>
<td></td>
<td>Compulsory Course VI</td>
<td>To be Selected from the list of Compulsory Courses (Skill Based)</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Odd</td>
<td>BSCCSC0305</td>
<td>Major Core Course V</td>
<td>System Analysis &amp; Design</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>BSCCSC0306</td>
<td>Major Core Course VI</td>
<td>Data Base Management System</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Minor Elective Course III (a)</td>
<td>To be Selected from the list for Minor Elective Subject other than Computer Science</td>
<td>3</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>Minor Elective Course III (b)</td>
<td>To be Selected from the list for Minor Elective Subject other than Computer Science</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>BSCCSC0306(P)</td>
<td>Major Core Lab</td>
<td>Data Base Management System Lab III</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Course VI</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>GI and H Course III</td>
<td>To be Selected from the list GI and Hobby Courses</td>
<td>2</td>
<td></td>
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<tr>
<td>IV</td>
<td>BSCCSC0407</td>
<td>Major Core Course VII</td>
<td>Operating System</td>
<td>4</td>
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<tr>
<td>Even</td>
<td>BSCCSC0408</td>
<td>Major Core Course VIII</td>
<td>Data Structure</td>
<td>3</td>
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<tr>
<td></td>
<td></td>
<td>Minor Elective Course IV (a)</td>
<td>To be Selected from the list for Minor Elective Subject other than Computer Science</td>
<td>4</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>Minor Elective Course IV (b)</td>
<td>To be Selected from the list for Minor Elective Subject other than Computer Science</td>
<td>4</td>
<td></td>
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<tr>
<td></td>
<td>BSCCSC0408(P)</td>
<td>Major Core Lab</td>
<td>Data Structure Lab IV</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Course VIII</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Core / Elective Course (Additional)*</td>
<td></td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>V</td>
<td>BSCCSC0509</td>
<td>Major Core Course IX</td>
<td>Software Engineering</td>
<td>4</td>
<td></td>
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<tr>
<td>Odd</td>
<td>BSCCSC0510</td>
<td>Major Core Course X</td>
<td>Management Information System</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>BSCCSC0511</td>
<td>Major Core Course XI</td>
<td>Object Oriented Programming with C++</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Semester</td>
<td>Course Code</td>
<td>Course Type</td>
<td>Course Name</td>
<td>Credit(s)/week</td>
<td>Cumulated Credits Category-wise</td>
</tr>
<tr>
<td>----------</td>
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<td>---------------------------------</td>
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<tr>
<td></td>
<td>BSCCSC0612</td>
<td>Major Core Course XII</td>
<td>Fundamental of Networking</td>
<td>4</td>
<td>Core – 12 (56)</td>
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<tr>
<td></td>
<td>BSCCSC0613</td>
<td>Major Core Course XIII</td>
<td>Multimedia Technology</td>
<td>4</td>
<td>Core / Elective (additional) 1 28</td>
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<td></td>
<td>BSCCSC0614</td>
<td>Major Core Lab Course XIV</td>
<td>Project Development</td>
<td>4</td>
<td>Total 32 (148)</td>
</tr>
</tbody>
</table>

*Additional Elective Courses offered by Computer Science Department (can be chosen for earning credits over and above 56 Major subject credits, 40 Minor elective credits, 9 (Min.) Compulsory course credits and 1 (Min.) 3G I&H Course credits i.e. total 106 credits; for getting B.Sc. Degree a learner has to earn a minimum of 120 credits.)

<table>
<thead>
<tr>
<th>Semester</th>
<th>Course Code</th>
<th>Course Type</th>
<th>Course Name</th>
<th>Credit(s)/week</th>
<th>Cumulated Credits Category-wise</th>
</tr>
</thead>
<tbody>
<tr>
<td>V/VI</td>
<td>BSCCSC0615</td>
<td>Core / Elective Course (Additional)*</td>
<td>Digital Electronics</td>
<td>4</td>
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<tr>
<td>V/VI</td>
<td>BSCCSC0616</td>
<td>Core / Elective Course (Additional)*</td>
<td>Artificial Intelligence</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>V/VI</td>
<td>BSCCSC0617</td>
<td>Core / Elective Course (Additional)*</td>
<td>Internet Technology</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>BSCCSC0617(P)</td>
<td>Internet Technology Lab</td>
<td></td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>V/VI</td>
<td>BSCCSC0618</td>
<td>Core / Elective Course (Additional)*</td>
<td>Programming with JAVA</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>BSCCSC0618(P)</td>
<td>Programming with JAVA Lab</td>
<td></td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>V/VI</td>
<td>BSCCSC0619</td>
<td>Core / Elective Course</td>
<td>Computer Graphics</td>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>
### Open Elective Courses offered by Computer Science Department

<table>
<thead>
<tr>
<th>Semester</th>
<th>Course Code</th>
<th>Course Type</th>
<th>Course Name</th>
<th>Credit(s)/week</th>
<th>Cumulated Credits Category-wise</th>
</tr>
</thead>
<tbody>
<tr>
<td>V/VI</td>
<td>BSCCSC0617</td>
<td>Core / Elective Course (Additional)*</td>
<td>Internet Technology</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>BSCCSC0617(P)</td>
<td>Core / Elective Course (Additional)*</td>
<td>Internet Technology Lab</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>V/VI</td>
<td>BSCCSC0102</td>
<td>Core / Elective Course (Additional)*</td>
<td>PC Software</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>BSCCSC0102(P)</td>
<td>Core / Elective Course (Additional)*</td>
<td>PC Software Lab</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

### General Interest Courses Offered by Computer Science Department

<table>
<thead>
<tr>
<th>Semester</th>
<th>Course Code</th>
<th>Course Type</th>
<th>Course Name</th>
<th>Credit(s)/week</th>
<th>Cumulated Credits Category-wise</th>
</tr>
</thead>
<tbody>
<tr>
<td>I/II/III</td>
<td>BSCCSC**21</td>
<td>GI/H</td>
<td>Introduction to Window Operating System</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>I/II/III</td>
<td>BSCCSC**22</td>
<td>GI/H</td>
<td>e-Commerce</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>I/II/III</td>
<td>BSCCSC**23</td>
<td>GI/H</td>
<td>Cyber Law</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

(B) Structure of Minor Elective in Computer Science for other than Major Computer Science Students (Minimum Credits to be Earned=20). Other than Computer Science Major learner can do Double major by earning 34 more credits over and above 20 credits of Minor Elective.

List of Minor electives in Computer Science

<table>
<thead>
<tr>
<th>Semester</th>
<th>Course Code</th>
<th>Course Name</th>
<th>Course Name</th>
<th>Credit(s)/week</th>
<th>Cumulated Credits Category-wise</th>
</tr>
</thead>
<tbody>
<tr>
<td>I/II/III</td>
<td>BSCCSC0101</td>
<td>Minor Elective Course I (a)</td>
<td>Computer Fundamental</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>BSCCSC0102</td>
<td>Minor Elective Course II (a)</td>
<td>PC Software</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>BSCCSC0102(P)</td>
<td>Minor Elective Course II (a)</td>
<td>PC Software Lab</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>
Compulsory (Skill Based) Course based on “spokentutorial.org” based on National Mission of Education through Information and Communication Technology (NMEICT), MHRD, Government of India.
UNIT-I

Introduction: Characteristics of Computers, Evolution of computers, Capabilities and limitations of computers, Generations of computers, Types of computers (micro, mini, main frame, supercomputers), Block diagram of computer, Basic components of a computer system- Input unit, output unit, Arithmetic logic Unit, Control unit, Central Processing Unit, Instruction set, registers, processor speed, type of processors, Memory- main memory organization, main memory capacity, RAM, ROM, EPROM, PROM, cache memory, PCs specifications.

UNIT-II


UNIT-III

Computer Software: Software, its Need, Types of software-System software, Application software, System software-operating system, utility program, programming languages, assemblers, compilers and interpreter, introduction to operation system for PCs-DOS, windows, linux, file allocation table (FAT & FAT32), files & directory structure and its naming rules.

UNIT-IV

Programming languages-machine, assembly, high level, 4GL, their merits and demerits, application software and its types – word-processing, spreadsheet, presentation graphics, Data Base Management Software, Characteristics, Uses and examples and area of application of each of them, Virus working, feature, types of viruses, virus detection, prevention and cure.
**Text & Reference books:**


**Note:** In each theory paper, nine questions are to be set. Two questions are to be set from each Unit and candidate is required to attempt at least one question from each unit. Question number nine will be compulsory, which will be of short answer type with 5-10 parts, out of the entire syllabus. In all, five questions are to be attempted.
UNIT -I

DOS commands: (internal (DIR, DATE, TIME, CLS, CD, RD, MD, PATH, TYPE, DEL, ECHO, COPY, REN, PROMPT, VOL, VER), external (ATTRIB, CHKDSK, DISKCOPY, DISKCOMP, XCOPY, TREE, DELTREE, DOSKEY, FORMAT, FIND, SORT, FDISK, MORE, SYS)), Concept of files & directories, Wild card characters, Redirection operators. 

Windows 7: Definition, Benefits, Features & uses of Windows 7, Control panel, Accessories, Task bar, My computer uses, Recycle bin.

UNIT -II


UNIT -III


UNIT -IV

Presentations: Definition, Benefits, Features & Uses of PowerPoint, Menus, Toolbars, Creating and Editing Slides, Adding graphics, Multimedia, and Special Effects to Slides, Insert (picture, slide, text), Master slide, Views, Animation, Action buttons, Macros.
Text & Reference Books:


Note: In each theory paper, nine questions are to be set. Two questions are to be set from each Unit and candidate is required to attempt at least one question from each unit. Question number nine will be compulsory, which will be of short answer type with 5-10 parts, out of the entire syllabus. In all, five questions are to be attempted.
UNIT-I

Data representation: number systems, decimal to binary, octal and hexadecimal conversion and vice versa, binary coded decimal numbers, hamming code for error detection, alphanumeric codes, arithmetic operations, binary addition and subtraction, addition/subtraction of numbers in 1’s and 2’s complement notation for binary numbers and 9’s and 10’s complement notation for decimal numbers, binary multiplication and division.

UNIT-II

Register Transfer Language: Register transfer, Bus and Memory transfer (three-stage bus buffers, memory transfer), arithmetic micro-operations Logic micro-operation (list of logic micro-operations, hardware implementation), shift micro-operations (hardware implementation), arithmetic logic shift unit, instruction codes (stored program organization, indirect address), computer registers (common bus register).

UNIT-III

Computer instructions (instruction set completeness), timing and control, instruction cycle (fetch and decode, types of instruction, register-reference instructions), Micro programmed control, control memory, addressing sequencing (conditional branching, mapping of instructions, subroutine) Central Processing Unit: Introduction, general register organization (control word, examples of micro-operations), stack organization (register stack, memory stack, reverse polish notation, evaluation of arithmetic expressions)

UNIT-IV

Instruction formats (three-address instructions, two address instructions, one-address instructions), addressing modes. Input Output Organization: Introduction to peripheral devices, input output interface (I/O bus and interface modules, I/O versus memory bus, isolated versus memory-mapped I/O), asynchronous data transfer (strobe control, handshaking).

Text and reference books:

**Note:** In each theory paper, nine questions are to be set. Two questions are to be set from each Unit and candidate is required to attempt at least one question from each unit. Question number nine will be compulsory, which will be of short answer type with 5-10 parts, out of the entire syllabus. In all, five questions are to be attempted.
UNIT-I

Introductory Concepts: Introduction to computers, Computer characteristics, modes of operation, Types of programming languages, Introduction to C, some simple C programs, Desirable program characteristics.
C Fundamentals: C character Set, Identifiers and keywords, data types, constants, variables and arrays, Declarations, expressions, statements, Symbolic constants.

UNIT-II

Operators and expressions: Arithmetic operators, unary operator, Relational and logical operators, assignment operators, conditional operators, Library Functions.
Data Input and Output: Preliminaries, singe character input, singe character output, Entering input data, writing output data, the gets and puts function.
Preparing and Running a Complete C Program: Planning a program, Writing a C program, entering the program into the compiler, compiling and executing the program, error diagnosis, debugging techniques.

UNIT-III

Arrays: Defining an array, processing an array, passing arrays to functions, Multidimensional arrays, Arrays and strings.

UNIT-IV

Functions: Defining a function, accessing a function, function prototypes, passing arguments to a function, recursion.
Pointers: Fundamentals, Pointer declarations, Passing pointers to the functions, pointers and one dimensional array, dynamic memory allocation, Operations on pointers, arrays of pointers.
Text & Reference Books:


Note: In each theory paper, nine questions are to be set. Two questions are to be set from each Unit and candidate is required to attempt at least one question from each unit. Question number nine will be compulsory, which will be of short answer type with 5-10 parts, out of the entire syllabus. In all, five questions are to be attempted.
UNIT -I


UNIT –II


UNIT –III

System requirement specification and analysis: Fact finding techniques, Data Flow Diagrams, Data Dictionaries, process organization and interaction, Decision Analysis, Decision Trees and Tables, Top down and bottom up variance, Audit trails.

UNIT –IV

Detail Design: Modularization, module specification, file design, system development involving databases. System Control and Quality Assurance: Design objectives reliability and maintenance, software design and documentation tools, unit and integration testing, testing practice and plans, system control.

Text & Reference Books:


Note: In each theory paper, nine questions are to be set. Two questions are to be set from each Unit and candidate is required to attempt at least one question from each unit. Question number nine will be compulsory, which will be of short answer type with 5-10 parts, out of the entire syllabus. In all, five questions are to be attempted.
BSCCSC0306 - Data Base Management System

UNIT-I

Introduction To Database Concepts: Data Modeling for a Database, Fields, Records and Files, Abstraction and Data Integration, Database Architecture, Users, Structure of DBMS, Advantages and Disadvantages of DBMS.

Data Models: Entity, Attribute, Relationship, Data Model Classifications, File based, Traditional, Semantic, Entity-Relationship Model.

UNIT-II

File Organization: Operation on files, Sequential Files, Index-Sequential Files, Types of Indexes, Implicit, limit, multilevel, Direct Files, Indexing using B-Tree Structure.

Relational Model: Relational Database - Relational Algebra, Relational Calculus.

UNIT-III

Relational Database Design: Relational Scheme and Relational Design, Functional Dependency, Normal forms (First, Second, Third, Boyce Code), Decomposition and dependency preservation, Multi-valued dependency.

UNIT-IV

MS Access: Tables (Creation/Design structure, Data Entry), Primary keys, Foreign Keys Master-Detail Table, Query (Select, Make-Table, Update, Append, Delete) Form (Modal, Modeless), Relationships Report (Creation of a simple report from a table and from a query).

Text & Reference Books:

2. Bipin C. Desai, “An Introduction to Database Management System”.

Note: In each theory paper, nine questions are to be set. Two questions are to be set from each Unit and candidate is required to attempt at least one question from each unit. Question number nine will be compulsory, which will be of short answer type with 5-10 parts, out of the entire syllabus. In all, five questions are to be attempted.
BSCCSC0407 - Operating System

UNIT –I


UNIT –II


UNIT –III


UNIT –IV

Memory Management: Partition, Paging, Segmentation, Types Of Memory Management Scheme, Bare Machine, Resident Monitor, Swapping, Multiple Partition, Virtual Memory, Demand Paging.

Text & Reference Books:


Note: In each theory paper, nine questions are to be set. Two questions are to be set from each Unit and candidate is required to attempt at least one question from each unit. Question number nine will be compulsory, which will be of short answer type with 5-10 parts, out of the entire syllabus. In all, five questions are to be attempted.
UNIT-I

Preliminaries: Concept & notation, common operation on data structures, algorithm complexity, time-space trade off between algorithm, physical & logical representation of different data structures. Arrays: Arrays defined, representing arrays in memory, Various operation (traversal, insertion, deletion), Multidimensional arrays, Sequential allocation, Address calculation.

UNIT-II

Linked List: Definition, type (linear, circular, doubly linked, inverted), representing linked lists in memory, advantages of using linked list over arrays, various operations on Linked list (traversal, insertion, deletion).

UNIT-III

Stacks: Definition & concepts of stack structure, Implementation of stacks, Operation on stacks (push & pop), Application of stacks (converting arithmetic expression from infix notation to polish and their subsequent evaluation), quick sort technique to sort an array, recursion). Queue: Definition & concept of queues, implementation of queue, operation on queues (insert & delete), circular queue.

UNIT-IV


Text & Reference Books:


Note: In each theory paper, nine questions are to be set. Two questions are to be set from each Unit and candidate is required to attempt at least one question from each unit. Question number nine will be compulsory, which will be of short answer type with 5-10 parts, out of the entire syllabus. In all, five questions are to be attempted.
BSCCSC0509 – Software Engineering

UNIT – I


UNIT – II


UNIT – III

Software Requirements Analysis & Specifications: Requirements Engineering, Types of Requirements, Feasibility Studies, Requirements Elicitation, Requirements Analysis Documentation, Validation and Management.

UNIT – IV

Function Oriented Design: Design principles, Module level Concepts, Notation & Specification, Structured Design Methodology, Verification

Text & Reference Books:

Note: In each theory paper, nine questions are to be set. Two questions are to be set from each Unit and candidate is required to attempt at least one question from each unit. Question number nine will be compulsory, which will be of short answer type with 5-10 parts, out of the entire syllabus. In all, five questions are to be attempted.
BSCCSC0510- Management Information System

UNIT –I


UNIT –II


UNIT –III


UNIT –IV


Text & Reference Books:

2. Surendra Basandra, “Computers Today”.

Note: In each theory paper, nine questions are to be set. Two questions are to be set from each Unit and candidate is required to attempt at least one question from each unit. Question number nine will be compulsory, which will be of short answer type with 5-10 parts, out of the entire syllabus. In all, five questions are to be attempted.
UNIT-I
Object oriented programming: Need for OOP, object oriented approach, characteristics of OOP language- objects, classes, Inheritance, Reusability, Polymorphism, overloading advantage of OOP, relationship between C and C++.
Programming Basic: Basic program construction, output using cout, preprocessor directive, comments, integer variables, character variables, input with cin, Type bool, setw Manipulator, type float, type conversion, arithmetic operators, relational operators, logical operators.

UNIT-II
Loops and decision control statements: loop- for, while, do, decision-if, if-else, switch, conditional operator, other control statements- break, continue, goto.
Functions: Simple functions, passing arguments to functions, Returning values from functions, reference arguments, overloaded functions, storage classes, scope resolution operator.

UNIT-III
Arrays: Array fundamental-defining array, array elements, Accessing array elements, Initializing arrays, multidimensional arrays, passing arrays to functions, array of objects, strings-string variables, Avoiding Buffer overflow, string constants, array of strings string as class members, Standard C++ string Class.
Objects and classes: A simple class, classes and objects, specifying a class, using a class, C++ objects as physical objects, C++ objects as data types, Constructors, objects as function arguments, returning objects from functions.

UNIT-IV
Inheritance: Derived class and base class, specifying the derived class, accessing base class, members, derived class constructors, overriding member functions, class hierarchies, public and private Inheritance, levels of inheritance, multiple inheritance, Ambiguity in Multiple Inheritance, Aggregation- Classes Within Classes.
Text & Reference Books:


Note: In each theory paper, nine questions are to be set. Two questions are to be set from each Unit and candidate is required to attempt at least one question from each unit. Question number nine will be compulsory, which will be of short answer type with 5-10 parts, out of the entire syllabus. In all, five questions are to be attempted.
BSCCSC0612- Fundamentals of Networking

UNIT-I

Introduction to Communication Network: Computer Networks,(Need, uses, and Advantages of Computer Network), Network Models (Peer-to-Peer-Network, Server-based Network, Client-Server Network), Network components, Network Topology (Star, Ring, Bus, Mesh, Tree, Hybrid) Advantage and Disadvantage of each types, Types of Networks (LAN, MAN, WAN), Internet (Brief History, Internet Protocol and Standard).

UNIT-II

Error Detection and Correction: Types of errors (Single–bit-error, Burst-Error), Error Detection (Redundancy, Parity check, CRC, Checksum), Error correction (FEC, Hamming code, Burst error corrections), Data Communication Channel and Media, Conductive Media (Twisted-pair cable, Coaxial cable), Fiber optics (Characteristic of light, Types of Fiber optics), Wireless Transmission, (Microwaves, Infrared, Radio waves).

UNIT-III


UNIT-IV


Text & Reference Books:


Note: In each theory paper, nine questions are to be set. Two questions are to be set from each Unit and candidate is required to attempt at least one question from each unit. Question number nine will be compulsory, which will be of short answer type with 5-10 parts, out of the entire syllabus. In all, five questions are to be attempted.
UNIT-I


UNIT-II


UNIT-III


UNIT-IV

Video: Basics of Video Analog and Digital Video, How to use video on PC. Introduction to graphics accelerator cards, Brief note on various video standards NTSC, HDTV, Introduction to video capturing Media & instrument Videodisk. Virtual Reality Terminology Head Mounts Display (HMD), Boom, Cave, Input Devices and Sensual Technology

Text & Reference Books:


Note: In each theory paper, nine questions are to be set. Two questions are to be set from each Unit and candidate is required to attempt at least one question from each unit. Question number nine will be compulsory, which will be of short answer type with 5-10 parts, out of the entire syllabus. In all, five questions are to be attempted.
BSCCSC0615 - Digital Electronics

UNIT-I

Fundamentals of semiconductor physics: Energy bands in solids- pn-junction diode depletion region, forward and reverse bias, diode as switch; Bipolar Junction Transistor, transistor configurations, bipolar junction transistor (CE configuration) as switch, Saturated and non-saturated logic, Integrated Circuits, characteristics of digital logic families-TTL, ECL, CMOS.

UNIT-II

Logic gates: AND, OR, NOT Gates and their Truth Tables, NOR, NAND & XOR gates, Boolean algebra, Basic Boolean Law’s, Demorgan’s theorem, Boolean function and their truth tables.

UNIT-III


UNIT-IV


Text & Reference Books:


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UNIT – I

Overview of Artificial Intelligence: Definition Of AI, The Importance Of AI, Previous Works In The History Of AI, AI And Related Fields, Problems, Problem Spaces And Search.

UNIT – II

Knowledge: General Concepts, Definition and Importance of Knowledge, Knowledge-Based Systems, Representation of Knowledge, Knowledge Organization, Knowledge Manipulation, Acquisition of Knowledge.
Structural Knowledge: Graph, Frames and Related Structures.

UNIT – III


UNIT – IV


Text & Reference Books:


Note: In each theory paper, nine questions are to be set. Two questions are to be set from each Unit and candidate is required to attempt at least one question from each unit. Question number nine will be compulsory, which will be of short answer type with 5-10 parts, out of the entire syllabus. In all, five questions are to be attempted.
UNIT – I


UNIT – II


UNIT – III

Cascading Style Sheets: Introduction, Levels of style sheets, Style specification format, Selector, Forms, Property value form, Font properties, List properties, Colour, Alignment, Box model, Background Images, <span> & <div> tags.

UNIT – IV


Text & Reference Books:


Note: In each theory paper, nine questions are to be set. Two questions are to be set from each Unit and candidate is required to attempt at least one question from each unit. Question number nine will be compulsory, which will be of short answer type with 5-10 parts, out of the entire syllabus. In all, five questions are to be attempted.
UNIT – I
Introduction To Object Oriented Programming: Data Abstraction, Encapsulation, Inheritance (Public, Protected And Private), Polymorphism, Information Hiding.

UNIT – II
Control Statements—Selection (if, switch), Iteration Statements (while, do-while, for) Jump Statements (break, continue, return), Arrays (One-dimensional, Multi-Dimensional).

UNIT – III
Introducing Classes: Class Fundamentals, Declaring Objects, Methods, Constructors, ‘This’ Keyword, Over loading Methods.
Inheritance: Inheritance Basics, Protected Members, Method Overriding, Multiple Inheritance.

UNIT – IV
Exception Handling: Fundamental, Exception Types, Uncaught Exceptions, Try And Catch, Dealing With Exceptions (try, throw, throws, finally).

Text Book:

Reference Books:

Note: In each theory paper, nine questions are to be set. Two questions are to set from each Unit and candidate is required to attempt one question from each unit. Question number nine will be compulsory, which will be of short answer type with 5-10 parts, out of the entire syllabus. In all, five questions are to be attempted.
UNIT – I


UNIT – II

Output Primitives: Line Drawing Algorithms (DDA, Bresenham’s ), Circle Generating Algorithm (Midpoint Circle Drawing Algorithm), Ellipse Generating Algorithm, Midpoint Ellipse Generating Algorithm, Character Generation.

UNIT – III

2D Transformations: Translation, Rotation, Scaling, Reflection, Shear, Composite Transformation-Translation, Rotations, Scaling.

UNIT – IV

Two Dimensional Viewing: Window-To-Viewport Coordinate Transformation, Clipping Operations, Point Clipping, Line Clipping (Cohen-Sutherland Line Clipping, Liang-Barsky Line Clipping), Polygon Clipping (Sutherland-Hodgeman Polygon Clipping, Weiler-Atherton Polygon Clipping).

Text & Reference Books:


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UNIT – I
Visual Basic Overview: Creating a project in visual basic the parts of a visual basic project, visual basic programming conventions- variable scope prefixes, variable prefixes, control prefixes menu and constant prefixes, best coding practices in visual Basic- program design language, coding to get the most from visual basic.

UNIT – II
Visual Basic Language: Declaring constants, variable selecting variable types, converting between data types, setting variable scope, verifying data types declaring arrays and dynamic arrays,

Declaring subroutines, functions, preserving variable values between calls to their procedures, Handling strings, operators and operator precedence, if-else statements, select case, switch () and choose, Looping.

UNIT – III
Managing forms in Visual Basic: The parts of a form the part of an MDI form Adding toolbar, status bar to the forms, working with multiple form loading, showing and hiding forms, setting the start up form, arrays of forms.
Coordinating data between MDI child from visual basic menus, command buttons, check boxes, List boxes and combo boxes, scroll bars and sliders, picture boxes and Image control.

UNIT – IV
File handling and file control, working with graphics, working with images, creating Active X controls and documents.

Text & Reference Books:

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BSC 21 - Introduction to Windows Operating System

UNIT –I

UNIT –II

UNIT –III
Managing Folders and Files- Navigate to Folders with Windows Explorer, Work with Folders and Files, Copy Data on Storage Media, Renaming files and folders, Deleting files and folders, Views.

UNIT –IV
Windows Setting- Control Panels, Setting the date and Sound, Concept of menu Using Help, Using right Button of the Mouse, Creating Short cuts, Basics of Window Setup, Notepad, Window Accessories, Device manager, System restore.

Text & Reference Books:

Note: In each theory paper, nine questions are to be set. Two questions are to be set from each Unit and candidate is required to attempt at least one question from each unit. Question number nine will be compulsory, which will be of short answer type with 5-10 parts, out of the entire syllabus. In all, five questions are to be attempted.
UNIT-I


UNIT-II


UNIT-III


UNIT-IV

Securing the Business on Internet: security Policy, Procedures and Practices, transaction security, CRM, what is e-CRM, it’s applications, The e-CRM marketing in India, Major Trends, Global Scenario for e-CRM, CRM utility in India.

Text & Reference Books:

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UNIT – I

UNIT – II

UNIT – III

UNIT – IV

Text and Reference Books:

Note: In each theory paper, nine questions are to be set. Two questions are to set from each Unit and candidate is required to attempt one question from each unit. Question number nine will be compulsory, which will be of short answer type with 5-10 parts, out of the entire syllabus. In all, five questions are to be attempted.
**Unit - I**
Basics of C- Introduction of C languages, Installation of gcc compiler in Linux OS.
Function, Variables in C - Tokens in C and C++, Functions in C and C++, Scope of Variables, how to define variables in the program.

**Unit- II**
Types of Statements in C- Introduction of Statements in C, If Statement, Else if Statement, Nested if statement, Switch Statements.

**Unit - III**
Arrays and Strings in C- Introduction of Arrays, How to write a Program using Arrays, Significance of Arrays, Working with 2D Arrays, String in C, String Library functions.

**Unit-IV**
Structures and Pointers - Introduction to Structures, Working with Structures, Introduction to Pointers, Understanding Pointers, Function Call, File handling In C.

Refer "spokentutorial.org" for online support and material.

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BSCCSC**25- Python

Unit- I
Python- Introduction and Installation of Python, with iPython, Using plot interactively, Embellishing a plot, Saving a plot, Multiple plot.
Additional features of iPython- Loading data from files, Plotting data, Other types of Plots

Unit- II
Lists – for, stings, files, Parsing data, Statistics, Arrays, Accessing parts of Arrays, Matrices.

Unit-III
Operators and Loops - Basic Datatypes and Operators, Input/Output, Conditional, Loops.
Manipulating lists, Manipulating strings, Tuples, Dictionaries

Unit- IV

Refer "spokentutorial.org" for online support and material.

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Unit -I

PHP - Introduction and Installation of PHP in Linux and Windows OS, Echo Functions, Variables, If Statement, Switch statement.


Arrays, Multi-dimensional Array.

Unit -II

Statements and Functions, Variables - While statement, Do-while statement, For statement, Foreach Statement, Functions(basic), Functions(Advanced), GET variable, POST Variable, Embedding PHP, Common Way to display HTML, Common Errors1, Common Errors 2, Common Errors 3

Unit - III

MySQL - MySQL 1, MySQL 2, MySQL 3, MySQL 4, MySQL 5, MySQL 6, MySQL 7, MySQL 8, Simple visitor counter, String function 1, String function 2, File upload 1, File upload 2.

Unit - IV

Cookies, Images display - Cookies 1, Cookies 2, Sessions, MD5 Encryption, Sending Email 1, Sending Email 2, Sending Email 3, Displaying images from directory, User login 1, User login 2, User login 3, User password change 1, User password change 2, User password change 3, User Registration 1, User Registration 2, User Registration 3, User Registration 4, User Registration 5, User Registration 6.

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Unit - I

Scilab - What is Scilab, Why we should use Scilab, Installing Scilab, Vector Operations in Scilab

Unit –II


Unit-III

Plotting 2D Graphs, Ordinary Differential Equations, Polynomials and Single board heater Introduction, Polynomials, Single board heater (SBHS) overview.

Unit - IV

Interface and Xcos - SBHS Interface, Xcos Introduction. Search Scilab Tool boxes on Web -Using Scilab Commands to solve Integration.

Refer "spokentutorial.org" for online support and material.

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